DB3

A SPATIAL DISTRIBUTION OF ADULT OBESITY PREVALENCE IN DENVER COUNTY, COLORADO: AN EMPIRICAL BAYES APPROACH

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OBJECTIVES: Measuring obesity prevalence across geographic areas must take into account environmental and socioeconomic factors that contribute to spatial autocorrelation across neighboring areas. Dependency among observations across a geographic area violates statistical independence assumptions and bias estimates. Empirical Bayes estimators "smooth" variables with spatial autocorrelation, which limits the overall mean square-error and controls for bias estimates. **METHODS:** Using a new system for BMI surveillance in Colorado, we modeled the spatial autocorrelation of adult (≥ 18 years old) obesity (BMI ≥ 30 kg m^{-2}) in Denver County using patient-level electronic health record data from Kaiser Permanente Colorado (KPCO) between 2009-2011. We used an Empirical Bayes tool to calculate smoothed obesity prevalence across census tracts. SAS 9.2 was used to clean and aggregate data. GeoDa was used to calculate the Moran's I statistic to test for spatial autocorrelation across census tracts and smooth BMI data. KP Maps was used to map smoothed obesity prevalence. **RESULTS:** Among patients with a valid BMI, we measure patient counts >= 10 across 143 census tracts in Denver County, for a total sample size of 46,241 adults. Crude obesity prevalence for adults was 27.01% (95% CI 25.50-28.51%) and ranged from 10.98-45.73% across census tracts. Smoothed obesity prevalence was 26.93% (95% CI 25.63-28.24) and ranged from 13.19-42.03%. The Moran's I statistic for crude obesity prevalence was 0.7407 ($p \leq 0.001$) and the Moran's I statistic for the smoothed obesity prevalence was 0.7469 ($p \leq 0.001$), suggesting adult obesity prevalence in Denver County is distributed in a non-random pattern. **CONCLUSIONS:** Results reveal smoothed obesity prevalence for adults are non-random in Denver County at the census tract level. Clusters of smoothed obesity are highly significant (alpha=0.05) in neighboring census tracts of high obesity prevalence. Concentrations of obesity are primarily in the west and northeast of the county, with less clustering of obesity in the central and southern parts of the county.

DB4

THE APPLICATION OF NATURAL LANGUAGE PROCESSING (NLP) TECHNOLOGY TO ENRICH ELECTRONIC MEDICAL RECORDS (EMRS) FOR OUTCOMES RESEARCH IN ONCOLOGY

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OBJECTIVES: Many studies which use EMRs to evaluate oncology patients and practises have caveats around partial/missing observations within patient records. We describe an approach to build a potentially richer oncology dataset, supplementing EMR with case note observations through the use of NLP, applied specifically for the capture of molecular data. **METHODS:** NLP concepts are identified and created based on broad topics such as medications, signs, disease and symptoms, measurements and observations. The data is harvested from the notes fields within the deidentified EMRs (including inpatient, clinics, pathological etc.) provided to Humedica from over 25 large health care systems throughout the United States. Each NLP concept included in the data is associated with a unique subject record and a date of observation; allowing longitudinal tracking of concepts such as a molecular entities. Data from NLP are linked to patient EMR records to allow inclusion of the additional variables in further analyses. The method was applied to identify molecular testing data in a specific cancer type. **RESULTS:** Of the 18,068 included patients with valid clinical notes for interrogation, patient notes for 1,027 were observed to have a defined observation of a molecular test specific for the target of interest; 46.3% (475) of which were deemed positive (i.e. indicating presence of the molecular target); 41.5% (426) negative; and 12.3% (126) with unknown status. **CONCLUSIONS:** Innovative algorithms, technical skills and clinical knowledge are required in the generation and analysis of oncology disease data, and NLP can allow enrichment with variables which are not included in EMR, allowing more detailed understanding of patient cohorts. We have described an approach deemed to be successful in identifying cohorts of oncology patients with researchable molecular characteristics. Further correlating evidence and cross validation will determine the robustness and representativeness of the data generated with this approach.

HEALTH CARE POLICY STUDIES

HC1

CADTH RECOMMENDATIONS AS PREDICTORS FOR DRUG AVAILABILITY IN BRITISH COLUMBIA AND ONTARIO

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OBJECTIVES: The Canadian Agency for Drugs and Technologies in Health (CADTH) conducts health technology assessments and provides recommendations for drug listing and reimbursement. However, the health care providers of individual Canadian provinces are not obligated to follow CADTH recommendations. The aim of this analysis is to assess the value of CADTH recommendations as predictors for drug availability in British Columbia and Ontario. **METHODS:** This study included 93 CADTH recommendations for 88 drugs across 30 disease conditions. The British Columbia and Ontario formularies and special access programs were searched for these 88 drugs (some drugs were included more than once as CADTH reviewed them for multiple indications). Agreement was defined as any case in which drugs received positive CADTH recommendations and were listed by a province's health care system or in which they received negative recommendations and were not listed. A CADTH recommendation was only considered "negative" when CADTH specifically recommended that a drug not be listed. **RESULTS:** CADTH recommendations are significantly associated with both British Columbia's drug listings ($p<.01$) and Ontario's drug listings ($p<.01$). CADTH recommendations agreed with British Columbia listing decisions for 74% of the drugs reviewed by CADTH. Ontario agreed with CADTH for 76% of the drugs. Positive CADTH recommendations in particular often translated to availability in British Columbia and Ontario. Of the 57 drugs that received positive CADTH recommendations, 82% (47) are available in BC and 93% (53) are available in Ontario. Of the 36 drugs receiving negative CADTH recommendations, 61% (22) are unavailable in BC and 50% (18) are unavailable in Ontario. **CONCLUSIONS:** A positive CADTH recommendation is a good predictor of drug availability in British Columbia and Ontario. A drug that receives a negative CADTH recommendation, however, still has a significant probability of being listed by each province's health care system, especially through their special access programs.

HC2

THE IMPACT OF NICE'S END-OF-LIFE THRESHOLD ON PATIENT ACCESS TO NEW CANCER THERAPIES IN ENGLAND AND WALES

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OBJECTIVES: In January 2009 NICE introduced supplementary advice to aid patient access to end-of-life treatments. The advice allowed existing cost-effectiveness thresholds, with an estimated upper limit of £30,000 per QALY, to be extended to treatments indicated for patients with a short life expectancy, provided they apply to small patient populations and are shown to extend life by at least 3 months. Previous research has determined this extended threshold to be around £50,000 per QALY. The aim of this study was to investigate the trends in end-of-life appraisals and recommendations since their introduction in 2009. **METHODS:** NICE single technology appraisals for cancer therapeutics were reviewed from 2008 to 2013. ICERs were extracted from appraisals evaluated against the end-of-life criteria. **RESULTS:** During the timeframe considered, 31 appraisals were evaluated against the end-of-life criteria. Of the 21 appraisals considered to meet the criteria, 13 were recommended for use on the NHS, with ICERs ranging from £31,800 to £51,800 per QALY. However, between 2009 and 2013, the average yearly ICERs for end-of-life appraisals increased from £41,633 to £72,667. This general increase was reflected by a subsequent decrease in approved treatments over time. Between 2010 and 2012, 8 end-of-life treatments were approved; this is compared to 5 recommendations issued in 2009 alone. In 2013, no new end-of-life treatments were approved by NICE, with a lowest ICER in the submitted appraisals of £50,200 per QALY. **CONCLUSIONS:** The general trend of increasing ICERs in new end-of-life cancer appraisals has resulted in fewer treatments being approved by NICE in recent years. Given the limiting effect this could have on improving patient access, this may mean that patients need to rely on other funding sources, such as the Cancer Drug Fund in England, to access novel cancer therapeutics.

HC3

INCENTIVIZING VALUE IN MANAGED CARE DRUG FORMULARIES: DESIGN, IMPLEMENTATION, AND FIRST-YEAR OUTCOMES OF A VALUE-BASED FORMULARY

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OBJECTIVES: Increases in drug cost sharing without regard to value may produce adverse financial and informational incentives which could increase health plan costs and worsen health outcomes in the long term. In an attempt to align utilization with value, Premera Blue Cross, a large not-for-profit health plan in the Pacific Northwest, implemented a value based formulary (VBF) which utilizes cost-effectiveness analysis to determine the evidence-based value of each individual drug. The value of each drug is used to determine the corresponding formulary tier placement for the drug. The objective of this study is describe the design, implementation and first-year outcomes of Premera's VBF. **METHODS:** We compared observed pharmacy cost per member per month (PMPM) in the year following VBF implementation to observed pharmacy costs twelve months prior and to an expected counterfactual estimate if no changes were made to the pharmacy benefits. The counterfactual estimate was generated using autoregressive integrated moving average applied to prior thirty-six months pharmacy costs. We assessed drug use and adherence among individuals with diabetes, hypertension, or dyslipidemia utilizing an interrupted time series design with a comparison group composed of members from three employer groups which had the same pharmacy copay increases but did not implement a VBF. **RESULTS:** Premera pharmacy costs decreased by 3% or 11% PMPM compared to the twelve months prior or counterfactual estimate respectively. Among individuals with diabetes, hypertension, or dyslipidemia in the VBF cohort, there was no significant decline in adherence or number of users of medications for the treatment of diabetes, hypertension, or dyslipidemia. **CONCLUSIONS:** Despite an overall higher member cost share structure and potential health plan savings, the VBF was potentially able to maintain medication utilization in key disease states. Subsequent analyses utilizing longer follow-up and greater control for confounding will establish more valid estimates of outcomes and costs.

HC4

THE POTENTIAL IMPACT OF RECOMMENDATIONS MADE THROUGH THE COMMON DRUG REVIEW PROGRAM AT THE CANADIAN AGENCY FOR DRUGS AND TECHNOLOGIES IN HEALTH

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OBJECTIVES: The Common Drug Review (CDR), a pan-Canadian program at the Canadian Agency for Drugs and Technologies in Health (CADTH), assesses the clinical effectiveness, cost effectiveness and patient evidence of new drugs to provide